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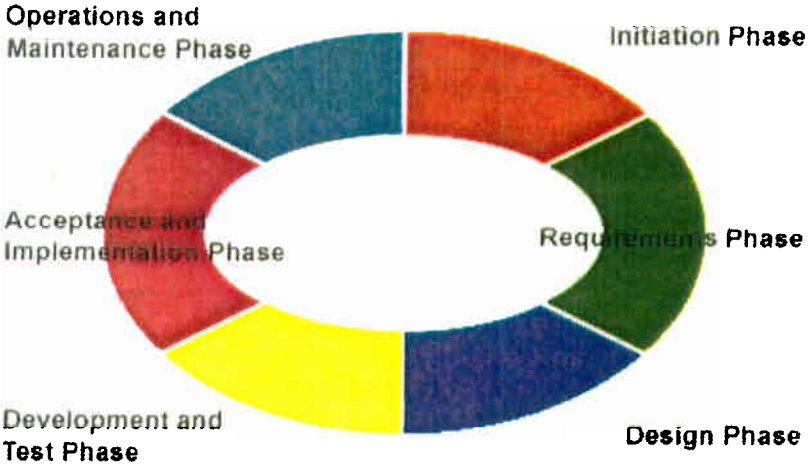
# The System Development Life Cycle (SDLC)




The SDLC was formed under a joint collaboration of the Inspector General (IG) and the Chief Information Officer (CIO). For more background information on the SDLC, take a look at the User Guide. For a list of SDLC-related terms and their definitions, click the link to the Glossary.

## Looking To Download Checklists?

Checklists corresponding to each of the six SDLC phases depicted to the left can be downloaded by clicking here.

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# SDLC User Guide

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## 1.0 Background

### 1.1 Scope

An Information Systems Development Methodology is a structured process followed by an organization to manage all phases of information system development and modification activities throughout the information system life cycle from inception through termination. The systems development methodology governs not only systems development efforts prior to implementation but also maintenance of the system after it becomes operational.

The Federal Government spends vast amounts of resources (i.e., money, time, and people) for the development, acquisition, and maintenance of computer-based information systems. Increasingly, the General Accounting Office (GAO) has reported the failure of high-profile government information system development projects to meet scheduled completion dates, estimated costs, and user requirements. In fact, GAO has identified government investment in Information Technology (IT) projects as a "high risk" area. In a September 1996 report entitled *INFORMATION TECHNOLOGY INVESTMENT: Agencies Can Improve Performance, Reduce Costs, and Minimize Risks*, the GAO states:

> (t)he management of IT projects . . . has long been a significant problem for many federal agencies. The federal government obligated more than $23.5 billion towards IT products and services in fiscal year 1994—about 5 percent of the government's total discretionary spending. Yet the impact of this spending on improving agency operations and service delivery has been mixed at best. Federal information systems often cost millions more than expected, take longer to complete than anticipated, and fail to produce significant improvements in the speed, quality, or cost of federal programs.

Organizations should follow a structured approach in planning, developing, acquiring, and maintaining information systems. Effective project management techniques combined with active user participation and the use of structured system development and maintenance methodologies could minimize the risk of missing scheduled completion dates, cost overruns, and user dissatisfaction throughout the information systems life cycle. The adequacy and completeness of controls established in information systems begins with the methods and procedures used during systems planning, design, development and implementation activities. Proper controls over these activities will help ensure that information systems are developed economically, meet user requirements, are thoroughly documented and tested, and contain appropriate cost-effective internal controls and audit trails. A standard systems planning, development, acquisition, and maintenance methodology should contain management's philosophy, guidelines, and direction in planning, developing, acquiring, and maintaining information systems.

Increasingly, the Commission's automation efforts and resources have been focused on development and enhancement of application systems supporting mission-related activities. These efforts include projects to automate and integrate the Commission's various application processing programs. Since 1996, the Commission has contracted out the majority of its systems development projects. The need for a structured framework to guide systems development and contract management efforts became clear.

In 1999, the Commission established a training program for contract management, specifically for Contracting Officer's Technical Representatives (COTR). Spearheaded by the Managing Director's Contracts and Purchasing Staff, the program included dissemination of COTR handbooks, orientation sessions for COTRs, and a computer-based training facility.

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## 1.2 Creation Of The FCC Systems Development Life Cycle (SDLC)

The Commission's Systems Development Lifecycle was developed as a cooperative effort between representatives from the Office of Inspector General (OIG), Information Technology Center (ITC), and Commission Bureaus and Offices. The development effort began in July 1998 and ended with the implementation of the SDLC during the last quarter of calendar year 2000.

The development team began researching numerous Commercial Off the Shelf (COTS) SDLC packages to determine whether one existed that could be tailored to meet FCC specific standards. Research included reviewing SDLCs within other government agencies. To accomplish this, the team sent a development methodology-specific questionnaire to 50 agencies to determine many factors, including what development approach was used, which COTS packages are used, and the rate of successful development projects.

Numerous planning meetings were held in which a model was developed and the activities, tasks, and roles were narrowed, modified, and tailored to meet the FCC's specific developmental requirements. After the basic framework of the SDLC was developed, the methodology was "piloted" on a series of development efforts to evaluate its usefulness prior to implementation. The FCC SDLC materials (i.e., SDLC phases, checklists, glossary, user guide and policy) can be found at the **SDLC Intranet website**

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## 2.0 Description Of The SDLC

The SDLC is intended to be used as a framework to assist project managers navigate through the systems development lifecycle. It is composed of six major project phases: Initiation, Requirements, Design, Development/Test, Acceptance/Implementation, and Operations/Maintenance. A brief description of each of the major phases of the life cycle are presented in this user guide, along with a summary of the major documents that must be produced in each phase. The entire SDLC can be found on the **SDLC Intranet website**. The SDLC web site provides a facility to download the MS Word document containing all phases of the SDLC including the specific activities and tasks that must be followed in managing software development efforts. The SDLC includes mandatory and optional task designation.

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## 2.1 Six Phases Of The SDLC

### 2.1.1 Initiation Phase

The primary functions of the SDLC Initiation Phase are the development of the project proposal by the Project Owner, the procurement package by the Contract Officer, and the contract award procedure by the Contract Officer. The key documents produced in this phase are the Project Proposal, Statement of Work (SOW), the contract, and the Work Breakdown Structure/Project Plan. In the SDLC, the Initiation Phase is the first phase and is followed by the Requirements Phase.

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### 2.1.2 Requirements Phase

The primary function of the Requirements phase is the development of an in-depth and exact description of the system's specifications, including developing system requirements and a systems development plan. The key documents produced in this phase are the Functional Requirements Document and Systems Development Plan. In the FCC SDLC, the Requirements Phase follows the Initiation Phase and is prior to the Design Phase.

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### 2.1.3 Design Phase

The primary function of the FCC SDLC Design Phase is the development of the approach and functional specifications on how to create the system. The primary goals of this phase are to develop the layout of the system and its alternatives. The key documents produced in this phase are the System Design Alternatives, the Design Specifications, the Security Design Specifications, the Configuration Management Plan, and the System Design document. In the FCC SDLC, the Design Phase follows the Requirements Phase and is prior to the Development and Test Phase.

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### 2.1.4 Development And Test Phase

The primary function of the FCC SDLC Development and Test Phase is to establish a code development environment, produce system code, evaluate code quality, resolve performance problems, initiate operations planning, and conduct bureau outreach activities. The key documents produced in this phase are the Implementation Plan, the Bureau Outreach Plan, the Business Continuity Plan, and system documentation. In the FCC SDLC, the Development and Test Phase follows the Design Phase and is prior to the Acceptance and Implementation Phase.

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### 2.1.5 Acceptance And Implementation Phase

The primary functions of the SDLC Acceptance and Implementation Phase are testing the system to ensure compliance with specifications, acceptance by the user, and moving of the system into production. The primary goals of this phase are to perform acceptance testing, implement the system, and resolve post implementation problems. The key documents produced in this phase are the Acceptance Test Plan and the Acceptance Test Report. In the FCC SDLC, the Acceptance and Implementation Phase follows the Development and Test Phase and is prior to the Operation and Maintenance Phase.

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### 2.1.6 Operation And Maintenance (O&M)

The primary functions of the FCC SDLC Operation and Maintenance Phase are the successful management, administration, and upkeep of a system on a routine basis. The primary goals of this phase are to operate and maintain the system and conduct a post-implementation review. The key document produced in this phase is the Post-Implementation Review. In the FCC SDLC, the Operations and Maintenance Phase is the sixth, or last phase, following the Acceptance and Implementation Phase.

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### 2.2 SDLC Glossary

The SDLC Glossary is designed to provide clear and concise definitions for the terminology used to describe the activities, personnel, and products that comprise the Commission's SDLC. In many cases, the terminology used in the SDLC is universally understood to describe the activities, personnel, and products that are a part of the information systems development process. However, in some cases the terminology is unique to the FCC. In addition to using terminology recognized as part of the information systems development process, the Commission's process also uses terminology from the Federal Procurement process. In these cases, the terms and documents referenced in the SDLC are further defined in the *Contracting Officer's Technical Representative (COTR) Handbook* developed by the Commission's Contracts and Purchasing Center.

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### 2.3 SDLC Documents

Developers and FCC management will produce required documentation corresponding to mileposts in the SDLC. Each stage of the SDLC will have requisite document deliverables, which are summarized according to stage in the following sub-sections.

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#### 2.3.1 Initiation Phase

- **Project Proposal**—The document that describes the process of planning, organizing, staffing, directing and controlling the production of a system. The Project Proposal includes the scope of the project, project objectives, business requirements, the equipment needs of the project, a cost and benefit analysis justifying the project in terms of dollars, anticipated interfaces, internal controls to be considered, security issues, and functionality.
- **Statement of Work (SOW)**—The procurement action that describes in precise terms the work (tasks, materials, services) to be procured to fulfill a requirement. Please refer to the Commission's COTR Handbook for a complete description of SOW requirements and structure.
- **Work Breakdown Structure/Project Plan**—A document that defines how responsibilities for the various activities in the system's life cycle will be divided. It contains a detailed work plan and provides the information required for effective management of the system, from inception to retirement. This document is a tool to provide focus, direction and proper coordination of activities. The Project Owner begins the development of the Work Breakdown Structure/Project Plan in the Initiation Phase. It is refined, modified, and expanded throughout the SDLC.
- **Monthly Project Status Report**—A report on the progress of a project submitted monthly to the Project Owner. The Monthly Project Status Report should address the overall progress of the project, any problems encountered, projected time frame (e.g., whether the project is on schedule), anticipated modification to the schedule, any reorganization in design or development, and tracking information for allocated funds. The Developer prepares this document for all phases, as required.
- **Quarterly Project Status Report**—A report on the progress of a systems development project submitted quarterly to the ITC. The Quarterly Project Status Report addresses the planned and actual completion dates of key milestones, the project budget showing planned and actual expenditures by fiscal year, major risk factors, and any deviation from past agreements that affect the design or the development schedule. The Project Owner prepares this document for all phases, as required.

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#### 2.3.2 Requirements Phase

- **Functional Requirements Document**—Describes the proposed system from the standpoint of business requirements to be satisfied. It should include input from both internal and external users. It serves as a basis of understanding between the user and the developer and provides information on performance requirements and user impacts, including fixed and continuing costs. It describes, in general terms, the data to be maintained by the system, the logical structure, and relationships of the data. The document is a major basis for the development of the system design and indicates many functional tests that will be required. The Project Owner develops this document during the Requirements Phase.
- **Systems Development Plan**—The detailed plan specifying the order in which system components are to be developed, tested and integrated. The Developer formulates this plan in the Requirements Phase.
- **Requirements Compliance Matrix**—A tool tracking the identified requirements through each phase of the life cycle, in order to determine whether each requirement is being met.
- **Project Risk Management Plan**—A plan identifying potential risks or vulnerabilities, as well as proposed actions to control and minimize risks for the project. Risk areas may include, but are not limited to: schedule, funding, technical resources, project sponsorship, change in requirements, user participation.

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### 2.3.3 Design Phase

- **System Design Alternatives**—Documents the high-level, feasible alternatives for a potential system, including the technical platform.
- **Process and Data Flow Diagrams**—A graphical representation describing how data flows between processes in a system. Similar to a flowchart, this is an important tool of most structured analysis techniques. Process and Data Flow Diagrams are utilized primarily in mainframe system development using traditional analysis and programming techniques.
- **Data Dictionary**—A centralized repository of information about data, including its meaning, relationship to other data, origin, usage, and format.
- **Data Models**—A paradigm depicting data structures and procedures used to manipulate and validate that data.
- **Data Conversion Plan**—Describes the procedures and activities required for the conversion of data from the existing system/databases to the new system/databases. The Developer produces this document during the Design Phase.
- **System Design Document**—Detailed description of the proposed system, including all elements developed during the design specification process. The System Design document includes such components as the design specifications and the security design specifications.
- **Configuration Management (CM) Plan**—The CM Plan outlines the method adopted to ensure proper control of hardware and/or software used in developing, modifying, and maintaining an information system. This document is initially developed during the Design Phase of the SDLC by the Developer and is continually revised throughout the life of the system. This document describes the organizational approach and specific procedures to be used to implement changes to control items, such as the software modules.

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### 2.3.4 Development And Test Phase

- **Training Strategy**—Outlines the training provided to managers, users, and operators and summarizes how training on system operations occurs. The Developer prepares this document during the Development and Test Phase.
- **Implementation Plan**—The document that describes the approaches as to testing, accepting, and moving the system into production. The Developer prepares this document during the Development and Test Phase.
- **Bureau Outreach Plan**—A written document detailing requirements to publicize and secure the support and acceptance of the users of the new system. A Bureau Outreach Plan may include such activities as formal presentations, meetings with industry representatives and customers, "brown bag" discussions, and postings to the bureau's website. The Project Owner should begin developing outreach plans shortly after the project has been approved. The outreach plans should address how external user requirements will be gathered, incorporated into the system and how feedback will be obtained once the system is put into use. The approach for conducting outreach activities must be documented during the Development and Test Phase.
- **Business Continuity and Contingency Plan (BCCP)**—A document stating the specific steps to be instituted in case of a system failure and for restoration of the affected business function. The BCCP details the system disruption policy. The system disruption policy includes the specific procedures to be followed in case the system or a critical part of the system becomes unavailable for any reason and the methodology for restoration of any impacted business function. The Developer may be required to develop this document during the Development and Test Phase.
- **System Documentation**—A series of handbooks designed to be a comprehensive guide for the system. Documents that are part of the systems documentation package include the System Manual, Operation Manual, and User Manual. The Developer documents the system during the Development and Test Phase.

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### 2.3.5 Acceptance And Implementation Phase

- **Acceptance Test Plan**—Outlines the plan for acceptance testing. The Acceptance Test Plan alerts

the system owner to the tests that will be conducted. The plan records the preparations (e.g., detailed procedures, data characteristics, and performance expectations) required to test the system properly to prove its adherence to contract requirements. The Acceptance Test Plan may be developed during the Acceptance and Implementation Phase by the Developer. However, the System Owner is responsible for verifying that the test plan is sufficient.

- **Acceptance Test Report**—This document describes the status of user/system owner acceptance testing activities during the testing process. It notes unanticipated events and potential problems and answers the following questions:
- How was testing conducted?
- What problems occurred?
- What potential problems/deficiencies were identified?
- What changes were made?
- What, if any, conditions were placed on acceptance of the product?

**NOTE:** The Developer prepares this document during the Acceptance and Implementation Phase and provides it to the Project Manager.

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### 2.3.6 Operations And Maintenance (O&M) Phase

- **Post-Implementation Review Plan**—The formal document outlining the strategy for conducting a Post-Implementation Review.
- **Post-Implementation Review Report**—— An assessment of the implemented system based on the experience of the initial period of system operation. This review addresses all aspects of the system including an evaluation of how the system met the original goals of the project, the degree of satisfaction with the system, technical performance, costs versus benefits, and system management issues.

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## 2.4 SDLC Roles And Responsibilities

The Commission's SDLC is a role based process. SDLC roles are the logically grouped responsibilities for related parts of the system development life cycle, for which a single individual or group can assume responsibility. In some cases, a single individual may assume a variety of roles in the course of a project. The SDLC is comprised of the following roles:

- **Associate Chief Information Officer (CIO)**—The Associate CIO is a member of the Information Technology Center (ITC) who coordinates technology issues on behalf of one or more of the Bureaus and Offices that the Associate CIO supports. The Associate CIO serves as the primary project interface between the Bureaus and Offices and ITC. The Associate CIO will provide any needed guidance regarding the SDLC.
- **Auditor** —An OIG representative responsible for reviewing the system development process to determine adherence to the SDLC and the requirements set forth for developing the system.
- **Contract Officer**—The individual who is the government's authorized agent in dealing with the contractor. The Contract Officer is the only individual who has the authority to negotiate and award a contract on behalf of the government and to make changes and amendments to a contract. At the FCC, the Contract Officer is located in the Contracts and Purchasing Center within the Office of the Managing Director. For additional details, please refer to the COTR Handbook.
- **Contracting Officer's Technical Representative (COTR)**—A person designated by a Contracting Officer to assist in seeing that a contractor's total performance is in accordance with the requirements of a contract and to protect the best interests of the government. The COTR is the person who is directly responsible for the technical evaluation of a contractor's performance. An employee becomes a COTR only by official appointment and is subject to the FCC COTR Directive. For additional details, please refer to the COTR Handbook.
- **Developer** –This term refers to the role performed by the group of technicians (employees or contractors) who are responsible for designing and building the new systems. In the SDLC, the developer role is all encompassing and includes those who perform similar functions, such as

designers, programmers, systems analysts, and systems engineers.
- **Project Owner**—The project owner has primary responsibility for the overall project. Responsibility for work to be completed under the task can be delegated; however, the owner has overall responsibility for ensuring that the project is completed. The project owner also has primary responsibility for tasks and activities in the SDLC, such as the project proposal in the Initiation Phase. In some cases the Project Owner and COTR are one in the same person.

The following FCC stakeholders are involved in the execution, oversight and/or management of the agency's Information Technology program:

- **Chief Information Officer (CIO)**—The CIO manages the Commission's Information Technology Center (ITC) within the Office of Managing Director (OMD). The CIO has overall responsibility for ensuring that the Commission's Systems Development Life Cycle (SDLC) is communicated and maintained. The CIO is responsible for identifying specific projects that will be required to use the Commission's SDLC. In addition, the CIO will participate, along with other senior agency managers, in the SDLC tasks/subtasks listed as B/O senior management.
- **Inspector General**—The Commission's Inspector General manages the operations of the Office of Inspector General (OIG). The statutory purpose of the OIG is to provide leadership, coordination and to recommend policies to promote economy, efficiency and effectiveness in the Commission's programs and administration and to detect fraud, waste and abuse. The Inspector General shall designate an OIG representative responsible for reviewing system development projects to determine adherence to the SDLC. This individual will perform the SDLC tasks/subtasks listed as Auditor. The OIG intends to monitor use of the SDLC at the FCC.
- **ITC Group Chiefs and staff**—The ITC employees who are responsible for a critical aspect of information technology matters at the FCC. They include the management, staff and contractors working for the Network Development Group, Planning and Support Group, Applications Integration Group, Operations Group. In addition, the ITC Computer Security Officer is responsible for the development of computer security policy and oversees information security operations at the FCC.
- **Technical Point of Contact (TPOC)**—A government employee who is a subject matter expert appointed to assist the COTR in administrating a contract.

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## 3.0 Using The SDLC

### 3.1 Organization Of SDLC

The SDLC is organized first by Phase; then by Activity, then by Task. The most useful way to envision using the SDLC is as a checklist. Within each Phase, the major Activities are broken down into Tasks and each Task has a key role that is responsible for the task execution. For example, in the Initiation Phase, the first Activity is to *Develop a Project Proposal* and the primary responsibility falls on the Project Owner. The very first Task is *Designate a Project Owner* and that is the responsibility of the sponsoring Bureau or Office. The Task to actually draft the Project Proposal falls on the Project Owner. Whereas, the Task to *Assist in preliminary project cost estimation and inclusion of project funding in the Commission Budget process* is a responsibility of the Associate CIO.

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### 3.2 SDLC Adherence

The major purpose of the SDLC is to provide a structured approach to help guide the development of a quality system at a reasonable cost—not rigid adherence to a process. Accordingly, the Project Owner may exercise some judgment in applying the SDLC. The Project Owner is expected to exercise a certain degree of freedom in interpreting the SDLC Tasks and in determining an appropriate course of action. For example, the Task of *Interviewing key stakeholders and representatives from the user community to identify general data input and desired system output* can be conducted in several acceptable ways: conducting focus groups, conducting interviews, conducting joint requirement planning sessions, etc. The Project Owner may decide to change the order of execution of the Tasks; the SDLC is not meant to be followed in an entirely

sequential manner. In some cases, a Task may be deferred until later during another Activity or Phase.

All activities and tasks in the FCC's SDLC are categorized as either mandatory or optional. Activities and tasks designated as mandatory must be completed to comply the FCC's SDLC requirement. Activities and tasks designated as optional are steps that are helpful in utilizing the SDLC to its maximum, but are not required to be completed to meet the FCC's SDLC requirement. The Project Owner can waive completion of optional activities and tasks. Optional activities and tasks in the FCC's SDLC are specifically labeled as 'optional.' Mandatory activities and tasks are not labeled. There will be occasions, however, where a task, or some aspect of a task, may not be applicable and the Project Owner must explain/document this in the record keeping

Although the Project Owner may use a great deal of judgment in interpreting the SDLC, it is meant to be a standard process followed in all major systems development efforts. The Inspector General will be reviewing system development projects to determine adherence to the SDLC.

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**3.3 SDLC Record Keeping**

The Project Owner is expected to maintain an electronic and/or hard copy of the SDLC checklist for each Phase. The checklist format allows information about how the task was completed to be recorded next to each Task. Documentation should be brief and specific. For example, in the Initiation Phase the Task to *Designate a Project Owner* might be documented in the following manner, "John Smith was designated as FCCFS Project Leader on 2/20/2001 by Bureau Chief Jones." And the Task to *Estimate preliminary costs for the project and identify the funding source* might be recorded as "FY2000 budget estimate is $345K; allocated on 4/11/2000 in ITC budget line #2000-16." The record keeping may be requested by the IG for review and used to evaluate the project.

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**Useful Links:**

- **SDLC Intranet website**
- **www.gantthead.com**
- **www.sei.cmu.edu**

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# SDLC Glossary

## Acceptance Test Plan

This document outlines the plan for acceptance testing. The ATP evolves throughout the life cycle, documenting the planning for the acceptance testing process, from initial strategy though detailed test plans.

## Acceptance Test Report (Decision To Accept Project)

This document describes the status of user acceptance testing activities during acceptance testing, noting unanticipated events and potential problems. The Acceptance Test Report also serves as a diagnostic tool.

## Associate Chief Information Officer (CIO)

The Associate CIO serves as the primary project interface between the Bureaus and Offices and ITC.

## Configuration Accounting Records

These documents outline modifications to any baseline products of the system life cycle. They contain procedures and formats for configuration, accounting or change control.

## Configuration Control Items

A listing of all items that will be placed under configuration management (CM). The identification of all configuration control items should be outlined in each project's CM plan.

## Configuration Management Plan

This document describes the organizational approach and specific procedures to be used to implement changes to control items. It also identifies the content and physical location of the system baseline.

## Contingency Plan

Outlines the project's plan to maintain normal operations in the unlikely event of a system failure.

## Contract Officer Technical Representative (COTR)

The COTR is responsible for contract type issues.

## Conversion Plan

This document describes the procedures and activities required for the conversion from the existing system/databases to the new system/databases.

## Cost-Benefit Analysis

This document outlines alternative approaches for solving the information management problem. The analysis contains the alternatives and criteria for evaluating them, assumptions pertinent to the analysis, expected benefits and costs of each alternative, a sensitivity analysis that reflects variation of the assumptions, and recommendation of the preferred alternative. It identifies the most desirable solution, or whether no solution is acceptable in view of the expected benefits and costs.

## Critical Path Activities

The essential concept behind Critical Path Analysis is that some plan activities are dependent on other activities being completed first. These dependent activities need to be completed in a sequence, with each activity being more-or-less completed before the next activity can begin.

## Data Base Specification

This document describes the storage allocation and data base organization and provides the basic design data necessary for the construction of the system files, tables, dictionaries, and directories.

## Data Dictionary

A centralized repository of information about data, including its meaning, relationship to other data, origin, usage and format.

## Decision To Accept Project

This is a decision document for presentation to program management. It demonstrates that the system as currently developed provides an acceptable solution to the information management problem.

## Definition Decision Paper (Decision To Proceed To Development)

This is a decision document for presentation to program management in support of the detailed functional and data requirements characterizing the information management problem. It provides a summary of the key analyses of the Design phase, emphasizing those aspects of the identified requirements that are important to program management.

## Design Decision Paper (Decision To Proceed To Development)

This document serves as a decision document for presentation to program management in support of the identified system design solving the information management problem. It provides a summary of the key analyses of the design phase, emphasizing those aspects of the system design that are important to management.

## Design Specifications

This document documents the high-level design for a selected system alternative including the technical platform. It synthesizes the results of other analyses and products to provide a clear picture of the recommended alternative as it is intended at the end of the Concept phase. It expands on Concept phase findings to fulfill detailed functional and data requirements, addressing data, input and output processing, interfaces with other systems, hardware software, communications, manual procedures and data conversion. It reflects any adjustments made to the requirements and to the selected alternative as a result of the cost-benefits analysis and/or risk analysis.

## Feasibility Study

Determines whether the proposed system will be cost-effective and if the system will be attainable with the commission's resources. The feasibility study should be a short and help the reader make the decision for

go, no-go decision.

## Functional Requirements Analysis

The process of determining the system requirements. This may include observing the existing system's faults and merits and interviewing potential users.

## Functional Requirements Document

This document describes the system requirements to be satisfied which will serve as a basis for understanding between the user and the developer. It provides information on performance requirements, preliminary design, and user impacts, including fixed and continuing costs. It describes data to be maintained by the system as well as the logical structure and relationships of the data. It acts as a basis for the development of system tests. It expands on the high-level functional requirements identified in the Concept phase.

## Functional Security Requirements

Functional Security Requirements are those application related security requirements specific to the use of the application or software being developed.

## Implementation Decision Paper (Approval/Decision To Operate)

This document serves as a decision document for presentation to program management. It demonstrates that the system solves the information management problem, and that all aspects of the system are ready for operation.

## Implementation Procedures

This document provides the necessary information to the functional users and data processing personnel to accomplish the installation of a previously tested system and to achieve operational status at additional sites.

## Interface Control Document

These documents are used to establish concurrence of customer and development organizations on interface requirements and design.

## IT Requirements

IT Requirements include network operations, data management requirements, contingency planning requirements, operational requirements, Laws, Federal Statutes, and Regulatory Standards Laws, Federal Statutes, and Regulatory Standards include rulemaking, OMB circulars such as OMB A-130, A-123, and A-127, Telecommunications regulations and laws, CFRs, FARs, Privacy Act, Computer Security Act, etc.

## Maintenance Manual

This document is used to provide reference information needed to modify the applications software in order to correct errors develop and implement enhancements to the system, and respond to changes in the system environment. It should also contain the information necessary to program the read-only memory components of a mission-critical system.

## Operations Manual

Contains precise and detailed information on the control requirements and operating procedures necessary

to successfully initiate, run and terminate the subject system. It contains the information necessary to identify malfunctions in the system, and troubleshoot the system. It also describes the functions and characteristics of the computer system within the overall system.

## Owner

The owner has the primary responsibility for a task or activity which can be delegated or assigned to someone else, but the designated person is still the owner and still responsible for the completion of the task or activity.

## Performance Report (Decision To Proceed To Installation And Checkout

This document presents the results of a formal assessment of the system. It describes the status of system and database use and operation during development, noting unanticipated events and potential problems. It serves as a diagnostic tool to aid the project manager, as well as evaluations of the system and databases. It may vary in scope, focusing on how well the system addresses the information management problem, technical performance of the system and/or system management practices. It provides specific recommendations where appropriate and notes those recommendations approved by program management for action.

## Post-Implementation Evaluation Report (Post Implementation Review)

This document presents a complete assessment of the implemented system based on the experience of the initial period of system operation. It addresses all facets of the system including degree of satisfaction of functional and data requirements, technical performance and system management.

## Program Specification

This document describes the program design in sufficient detail to permit program production by the programmer or coder.

## Project Owner

The owner has primary responsibility for a task or activity. Responsibility for work to be completed under the task can be delegated; however, the owner has overall responsibility for ensuring that the task is completed.

## Project Proposal

The Project Proposal includes the scope of the project, objectives of the project, business requirements, the equipment needs of the project, a cost and benefit analysis justifying the project, anticipated interfaces, internal controls to be considered, security issues, and functionality.

## Project Request Decision Paper (Decision To Proceed To Requirements)

This document describes the decision to continue with a proposed project. It describes in technology-independent terms the information management problem, and justifies undertaking the next phase of the life cycle. The Project Request Decision Paper has a strong programmatic emphasis, with minimal discussion of the potential solutions to the problem. The paper includes a preliminary estimate of the life cycle costs. No solutions are discussed unless it is clear that the problem can be solved by a minor enhancement to an existing system.

## Project Size

Project Size is determined in quantifiable terms such as lines of code or other methods to scope the size of the project.

## Requirements Compliance Matrix

This is a tool used to track the identified requirements through each phase of the life cycle in order to determine whether each requirement is being met.

## Requirements Specification

An in-depth and exact description of the system's stipulations. This document serves as a basis for agreement and understanding between the contractor (developer) and the commission. The requirements specifications must be updated regularly to correct unforeseen problems and changes in the proposed development.

## Risk Analysis

This document outlines the security and technical risks associated with the potential solution to the information management problem. It involves an estimate of the impact of a security failure and an estimate of its frequency of occurrence.

## Risk Management

A software engineering practice with processes, methods, and tools for managing risks in a project. Risk management provides a disciplined environment for proactive decision-making to assess risks, determine the important of risks, and implement strategies to deal with those risks.

## Roles

Roles are often times represented by the same person (i.e., multiple roles can be designated for one individual depending on the size and nature of the project).

## SDRM Roles

Roles are often times represented by the same person (i.e., multiple roles can be designated for one individual depending on the size and nature of the project).

## Security Manual

This document describes special security features, and related user procedures for those systems that process either confidential or highly sensitive data.

## Software Configuration Management Plan

This document describes the configuration management and change control procedures for the software development project.

## Software Quality Assurance Plan

This document describes the software QA program to be implemented during the life of a software development project.

## Source Selection Committee

Source Selection Committee is a group of FCC representatives brought together to determine the technical evaluation of the Contractor responses to a given RFP.

## Statement Of Work (SOW)

The SOW is used to define the extent of the activities to be performed in completing the development project. At a minimum, the SOW should include the deliverables to be provided to the Government, the framework for the deliverables and the development effort. Refer to the Commission's "COTR Handbook" for a complete description of SOW requirements and structure.

## System Concept Decision Paper (Decision To Proceed To Design Phase)

Contains a summary of all the findings of the concept phase and serves as the basis for the formal of the project to proceed to the Design phase.

## System Disposition Report

This document describes the rationale for ceasing system operations, documents the plan for ceasing operations and effectively archiving the various components of the system, and provides information about the location of archived materials. The document is vital to ensure that information about the system can be accessed to support reactivation of the system, or future reuse of portions of the current system by other systems.

## System Test Plan

This document outlines the plan for system testing. This plan evolves throughout the life cycle, documenting the planning or the system testing process, from initial strategy though detailed test plans.

## System Test Report (Review Of System Test)

This document describes the status of system testing activities performed by the project team, noting unanticipated events and potential problems.

## System/Subsystem Specification

This document provides a detailed definition of the system/subsystem functions. It is used to communicate details of the on-going analysis between the user's operation personnel and the appropriate development personnel. It defines in detail the interfaces with other system sand subsystems and the facilities to be utilized for accomplishing the interfaces.

## Technical Evaluation

A Technical Evaluation is the measurement of a Contractor's response to a Request for Proposal (RFP) against the award criteria conducted for the purpose of scoring the proposals and determining to whom the contract should be awarded.

## Test Plan

This document is a tool for directing the testing and contains the orderly schedule of events and list of materials necessary to effect a comprehensive test. It provides guidance for the management and technical effort necessary throughout the test period. It establishes a comprehensive test plan and to communicate to the user(s) the nature and extent of the tests deemed necessary to provide a basis for evaluation of the system. It is used to coordinate with the user an orderly schedule of events, a specification of equipment and organizational requirements, the methodology of testing, a list of materials to be delivered, and schedule of user orientation. It provides a written record of the actual test inputs to exercise system limits and critical capabilities, the instructions to permit execution of the test by the user staff and operator personnel, and the expected outputs.

## Test Results Report

This document describes the status of the computer program system after test and provides a presentation of deficiencies for review by staff and management personnel. It documents the results of the implementation test, provides a basis for allocating responsibility for deficiency correction and follow-up, provides a basis for the preparation of the statement of project completion, and establishes user confidence in the operation of the system.

## Training Manuals

These are documents such as presentation materials and documents used for training

## Training Report

This document describes the training provided to managers, users, and operators during implementation and summarizes the results of training activities.

## Unit Development Folder

This records software development activities associated with a program unit and provides basis for final as-built configuration.

## Unit Test

This document is used for unit-level testing.

## User Functional Requirement

The system features that the user requests for the operating system.

## User's Manual

This document provides the user with the information necessary to effectively use the system.

## Version Description Document

This document is used to describe content and capability of delivered software versions.

## Work Breakdown Structure/Project Plan

This document describes how the life cycle management approach will be tailored to suit the specific characteristics of the project. It contains a detailed workplan and provides other valuable project management information. It is used to provide direction and to endure the coordination of activities. It is developed in skeleton form during the Concept Phase and refined and expanded throughout the life cycle.

Download the Glossary in Word format.

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SDLC HOME | Policy | Practices | Roles & Responsibilities
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# SDLC Checklists

To download a checklist corresponding to a particular SDLC phase in Word format, click the name of that phase in the following table.

| Number | Name | Deliverables |
|---|---|---|
| 1 | Initiation | Project Proposal<br>Statement of Work (SOW)<br>Work Breakdown/Project Plan<br>Monthly Project Status Report<br>Quarterly Project Status Report |
| 2 | Requirements | Functional Requirements Document<br>Systems Development Plan<br>Requirements Compliance Matrix<br>Project Risk Management Plan |
| 3 | Design Phase | System Design Alternatives<br>Process and Data Flow Diagrams<br>Data Dictionary<br>Data Models<br>Data Conversion Plan<br>System Design Document<br>System Security Plan<br>Configuration Management (CM) Plan |
| 4 | Development and Test Phase | Training Strategy<br>Implementation Plan<br>Bureau Outreach Plan<br>Business Continuity and Contingency Plan |

| | | |
|---|---|---|
| | | System Documentation<br><br>Security Plan |
| 5 | Acceptance and Implementation | Acceptance Test Plan<br><br>Acceptance Test Report<br><br>Section 508 Compliance Form |
| 6 | Operations and Maintenance | Post-Implementation Review Plan<br><br>Post-Implementation Review Report |

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# Design Phase

**Project:** _____

## A. Coordinate with IT organizations on Design Phase Responsibility / Responsibility (COTR)

| STATUS | TASK |
|---|---|
| | 1. Setup a preliminary meeting with ITC to discuss parameters for system design alternatives. (Developer) |
| | 2. Conduct preliminary meeting with ITC to discuss alternative parameters. (Developer) |
| | 3. **Optional:** As needed, setup a follow-up meeting with ITC. (Developer) |
| | 4. **Optional:** Maintain contact with ITC. (Developer) |

## B. Prepare System Design Alternatives/ Responsibility (Developer)

| | |
|---|---|
| | 1. Develop selection criteria for System Design Alternatives, including Cost Benefit Analysis and system security. (Project Owner) |

| STATUS | TASK |
|---|---|
| | 2. Coordinate with the ITC Computer Security Officer to identify and recommend security solutions and safeguards for vulnerabilities to avoid or minimize threats. (ITC) |
| | 3. Develop System Design Alternatives. (Developer) |
| | 4. Present System Design Alternatives to the Project Owner. (Developer) |
| | 5. Ensure that System Design Alternatives consider high level risk factors (e.g., mission, cost, staffing, etc.) (Project Owner) |
| | 6. Document the System Design Alternatives at a review meeting and develop action items. ((Developer) |
| | 7. Present System Design Alternatives to ITC and other appropriate Senior Management. (Project Owner) |
| | 8. Select a System Design Alternative after incorporating input from ITC and other appropriate Senior Management. (Project Owner) |
| | 9. Direct the Developer to begin the System Design Specification development process. (Project Owner) |

## C. Prepare Design Specifications/ Responsibility (Developer)

| STATUS | TASK |
|---|---|
| | 1. Obtain ITC guidance on design specifications. (Developer) |
| | 2. Develop Process and Data Flow Diagrams for both physical and logical data flow. (Developer) |
| | 3. Identify data processing functional, validation and editing procedures. (Developer) |
| | 4. Develop Data Dictionary and Data Models using data syntax rules and data schemas. (Developer) |
| | 5. Update and maintain the Data Dictionary and Data Models.. (Developer) |
| | 6. As needed, create a Data Conversion Plan and ensure that it is updated as required. (Developer) |
| | 7. Review and approve the Data Conversion Plan. (COTR) |
| | 8. Develop estimates for file storage requirements for all software items in appropriate phases of the System Development Life Cycle and provide requirement estimates to the COTR. (Developer) |

| STATUS | TASK |
|---|---|
| | 9. Obtain estimates of software file storage requirements and coordinate availability of file storage resources with the ITC. (Project Owner) |
| | 10. Determine criticality of applications to support Business Continuity and Contingency Planning activities. (Project Owner) |
| | 11. Incorporate Business Continuity and Contingency Planning requirements into the System Design Document. (Developer) |
| | 12. Document the computing environments required for each phase of the development process (i.e., design, development and test, installation and acceptance, and operations and maintenance) and incorporate a description of these environments into the System Design Document. (Developer) |
| | 13. Develop hardware and software acquisition plans and coordinate with the ITC. (COTR) |
| | 14. Coordinate with the Contracting Officer to ensure that hardware and software acquisition plans meet the needs identified in the System Design Document. (COTR) |
| | 15. Prepare design specifications to address any applicable Commission Rules, federal laws and regulations (e.g., accessibility). (Developer) |

## D. Prepare Security Design Specifications/ Responsibility (Developer)

| STATUS | TASK |
|---|---|
| | 1. Document the security architecture (i.e., environment, platform, system, and data) and incorporate the architecture into the System Design Document. (Developer) |
| | 2. Document security guidelines for data handling, classification, and access protection. (Developer) |
| | 3. Ensure that the Data Dictionary and Data Models address data access rules and classification. (Developer) |
| | 4. Define authentication measures for identifying users. (Developer) |
| | 5. Develop draft Security Procedures including procedures for violation handling and authentication. (Developer) |
| | 6. Coordinate review of those sections of the System Design Document addressing security with the ITC Computer Security Officer. (ITC) |
| | 7. Modify Security Design Specifications to incorporate any changes resulting from the review by the ITC Computer Security Officer. (Developer) |

## E. Prepare System Design Document/ Responsibility (Developer)

| STATUS | TASK |
|---|---|
| | 1. Develop a System Design Document incorporating all elements developed during the design specification and provide to the COTR. (Developer) |
| | 2. **Optional:** Prepare and distribute an agenda for the System Design Document review meeting and conduct the meeting. (Developer) |
| | 3. **Optional:** Document the System Design Document review meeting and develop action items. (Developer) |
| | 4. Distribute the System Design Document to all ITC Chiefs requesting comments/feedback. (ITC) |
| | 5. Ensure that action items resulting from the System Design Document review process are addressed. (COTR) |
| | 6. Modify the System Design Document to incorporate any changes resulting from the review process. (Developer) |
| | 7. Review the final System Design Document. (COTR) |
| | 8. Accept the final System Design Document. (COTR) |

## F. Maintain Functional Requirements Document / Responsibility (Developer)

| STATUS | TASK |
|---|---|
| | 1. Update and maintain the Functional Requirements Document. (Developer) |
| | 2. Review the Functional Requirements Document to ensure items are traceable from beginning to end. (COTR) |
| | 3. Review the Functional Requirements Document to ensure cross bureau involvement as required. (ITC) |

## G. Configuration Management / Responsibility (Developer)

| | |
|---|---|
| | 1. Distribute ITC Configuration Control Guidelines to Developer. (ITC) |
| | 2. Document specific criteria to be used for identifying Configuration Control Items based on ITC Configuration Control Guidelines. (Developer) |

| STATUS | TASK |
|---|---|
| | 3. Identify additional Configuration Control Items and coordinate with ITC. (Developer) |
| | 4. Develop a Configuration Management Plan incorporating identified Configuration Control Items. (Developer) |
| | 5. **Optional:** Prepare and distribute an agenda for a Configuration Management Plan review meeting and conduct the meeting. (Developer) |
| | 6. **Optional:** Document the Configuration Management Plan review meeting and develop action items. (Developer) |
| | 7. Distribute the Configuration Management Plan to all ITC Chiefs requesting comments/feedback. (ITC |
| | 8. Ensure that action items resulting from the Configuration Management Plan review process are addressed. (COTR) |

| STATUS | TASK |
|---|---|
| | 9. Modify the Configuration Management Plan to incorporate any changes resulting from the review process. (Developer) |
| | Review the final Configuration Management Plan. (COTR) |
| | 10. Accept the final Configuration Management Plan. (COTR) |

## H. Transition to Development and Test Phase / Responsibility (Project Owner)

| | |
|---|---|
| | 1. Review developer progress and project progress to ensure it is in direction of end project goals (ITC) |
| | 2. **Optional:** Disseminate information to necessary Commission individuals (ex. Chairman, Bureaus, etc.). As required, conduct external information distribution through interactive training, conferences and conventions, licensee meetings, and brownbag meetings. (Project Owner). |
| | 3. Follow up on rulemaking activities as needed. (Project Owner) |
| | 4. Meet with FCC Section 508 Coordinator and developer to identify and document specific tools that will be used to validate Section 508 compliance in testing phase. (Project Owner) |

| STATUS | TASK |
|---|---|
| | 5. Perform contract modifications as required. (Contract Officer) |
| | 6. **Optional.** Provide Project Briefing to Senior Commission Management. (Project Owner) |

## I. Project Planning and Project Management / Responsibility (Project Owner)

| | |
|---|---|
| | 1. Review the Work Breakdown Structure/Project Plan and recommend changes within the scope of the Project Proposal and Statement of Work. (COTR) |
| | 2. Assess Work Breakdown Structure/Project Plan changes for contract implications. (COTR) |
| | 3. Revise the Work Breakdown Structure/Project Plan accordingly. (COTR) |
| | 4. Update Project Risk Management Plan that includes risk identification, mitigation, and prevention procedures. (Project Owner) |

| STATUS | TASK |
|---|---|
| | 5. Assist project owner with updating the Project Risk Management Plan and actively mitigating risks. (ITC) |
| | 6. Escalate outstanding problems or issues to appropriate sources for resolution. (COTR) |

## J. Project Tracking and Oversight/ Responsibility (Project Owner)

| | |
|---|---|
| | 1. Perform project financial management and oversight. (COTR) |
| | 2. Produce a Monthly Project Status Report that includes actual results and performance. (Developer) |
| | 3. Track contractor's actual results and performance through review of the Monthly Project Status Report (COTR) |
| | 4. Maintain records of change requests and implemented change records. (COTR) |

| STATUS | TASK |
|---|---|
| | 5. Prepare, review and distribute a Quarterly Project Status Report to the Managing Director. (Project Owner) |
| | 6. Notify the Office of Inspector General that the Design of the development process has been completed. (Project Owner) |
| | 7. Review Design Phase activities to verify compliance with the requirements in the SDLC. (Auditors) |